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# SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE •



APRIL 6, 1935

Beauty of Spring  
See Page 217

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SCIENCE SERVICE PUBLICATION

## SCIENCE NEWS LETTER

VOL. XXVII



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Current Science

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## DO YOU KNOW?

An Oxford University expedition will spend a year in North-East Land, far above the Arctic Circle.

In the pine regions of Oregon and Washington, pine beetles destroy eight times as much timber as forest fires.

Archaeologists digging at an old Alaskan village have found for the first time wooden canoes made by Eskimos.

A moving picture has been made to record the fundamentals of baseball—batting, pitching, fielding and base running.

Seed for growing the odorless cabbage developed at Cornell University will not be available in quantity for about two years.

For eight years the Brooklyn Botanic Garden has given a course to student nurses, teaching such subjects as the care of cut flowers.

California raisin growers have tried "greasing" seedless raisins before packing, using oil extracted from raisin seeds to prevent stickiness.

The rare occurrence of triplets born to a mother in a herd of American bison is reported from Catalina Island, California.

Dental students at the University of California study effects of nutrition on teeth by checking up on their own eating habits.

Contrary to popular belief, the United States before the World War had a chemical production greatly exceeding that of Germany.

Hogs were reduced by 20,000,000 last year, which is called "the most striking annual change ever shown in this country's livestock inventory."

A German high school teacher kept a weather record from 1819 until he died in 1872, and his daughter continued it until 1917, making a 98-year record.

The skill of blind persons in using their other senses to guide and inform them was commented on as early as 1749 when Diderot published a "Letter on the Blind."

## WITH THE SCIENCES THIS WEEK

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## ARCHAEOLOGY

# Mixtec "Family Album" May Hold Secret of Lost Language

**Less Known Than Mayas, Mixtecs Wrote in Hieroglyphics; Accompanying Spanish Script May Prove Key**

A KEY to the as yet unread Mixtec hieroglyphs of ancient Mexico may be contained in an ancient Indian "family album" written on deerskin.

This codex, or manuscript, was brought to light by Miss Emma Reh of Washington, D. C., student of Mexican archaeology, who hopes an attempt will be made to decipher the imperfectly legible family history of a line of ancient Mixtec chieftains recorded in the deer-skin book.

Because the unread native hieroglyphs are accompanied by Mixtec handwriting in the Spanish alphabet, there is hope that study of this manuscript will provide means of understanding the symbols in which Mixtec Indians wrote.

Mixtec culture thrived in Mexico well before the better known Aztec civilization which existed at the time of the Spanish conquest in 1521. Even less is known about Mixtecs than the Mayas who built great stone cities farther south in the Yucatan peninsula of Mexico.

The document has added value because its origin is known. The majority of Indian picture writings now existing in museums have been rediscovered in forgotten European archives where they were sent as curiosities of the New World centuries ago, or have been bootlegged out of Mexico in secret, contraband trade in antiquities.

The new-found Mixtec manuscript, now in the National Museum at Mexico City, comes from Oaxaca, in southern Mexico. It folds into a book of eleven accordion pleats, and is read from back to front. Writing, pictures and glyphs are in black.

The "album" begins with a line of three Indians seated before a house, the elegance of which attests to their noble standing. They wear the regal Indian headband, and their name-signs above their heads show that they are called Two Alligator, Four Deer, and Nine Dog, respectively.

Their story begins in the Indian year "Three House." The Spanish date 1300 occurs on page two.

On this page begins a long line of marriages between Indian nobles and native women. Bigamy is performed on page three, where a chief marries two wives at once. Town names in hieroglyphs accompany each married couple.

Great-great-grandfathers and grandmothers pictured on the first eight pages dress as Indians and wear the queer hieroglyphs above their heads which tell their personal names.

On page nine, however, a significant change takes place. The native men and women acquire Spanish names, even Spanish clothes. Christian crosses appear. This happens in 1610. It is known that the Spanish crown allowed Indian nobles to be called "Don" and "Dona." From this page on, these "civilized" Indians wear Shakespearean hats.

The family record ends in 1684. It may have served as "proof of nobility" in some Indian legal claims before the Spanish Viceroy, Don Luis de Velasco, who is mentioned within.

Indian codices had various functions.

Some were family records such as these. Others were religious or historical. Certain ones were "maps," or agreements between Indian towns as to their hereditary land limits.

Of the latter, some still exist in Oaxaca. Indians believe if they lose these "pergamins" they lose the right to their lands. None but the Indian elders ever see them.

A half-breed of Tlaxiaco described such a "map" to Miss Reh. It belongs to a nearby Mixtec town and is brought out only during local cornfield wars over boundaries, which rage fiercely and frequently there. Fighting is largely done with stones, as in pre-Spanish times.

This document is said to have shrines, human figures and roads painted in black and brown on deerskin, the roads being indicated by human footprints. The "map" is kept rolled around a cylindrical green stone, the whole folded in another deerskin for protection.

*Science News Letter, April 6, 1935*

## PHYSICS

## Dust Storms "Make Air Blue" By Light-Scattering Effect

BLUE LIGHT during a dust storm has no necessary connection with the color of the dust itself, but is an effect of the scattering of light that strikes the microscopically tiny particles that fill the air. This explanation of a phenomenon often noticed this spring is offered by



MIXTEC FAMILY RECORD

Prof. W. J. Humphreys, physicist of the U. S. Weather Bureau.

Daylight does not always turn blue during a dust storm, but only when the air is densely filled with particles of the right size, Prof. Humphreys said. Then the effect is not the blue haze of distance, but a bluishness of the light falling on objects near at hand: the letters on your desk will look as though you were working at night by the light of a dim blue lamp.

The light turns blue, rather than another color, because of all the wavelengths that combine to make up ordinary white daylight, blue is most sharply scattered, upon striking a reflecting surface. Other wavelengths are scattered also, but to a less extent than the blue,

so that blue comes to predominate. A similar bluing of the light occurs when a cloud of wood smoke, which is made up of very small particles, comes between the observer and the sun.

The same phenomenon is responsible for the blue haze of distance. There are always large numbers of reflecting dust and water particles in the air, though fortunately not nearly so many as during a dust storm. Where their density is relatively low, you have to look a long way to see a blue horizon, as in the Rocky Mountains. Where the particle density is high, as it is in the East, comparatively nearby objects assume the hazy appearance that have given Eastern mountains such characteristic names as the Blue Ridge and the Great Smokies.

*Science News Letter, April 6, 1935*

#### GEOGRAPHY

## Not "Going to Prairie-Dogs" Drought Cycles an Old Story

FARM distress in the Western drought belt, compelling a population retreat to better-favored lands, has also caused in some quarters a pessimistic belief that that part of the country is now going permanently to the prairie-dogs. The West, think these gloomy ones, is "drying up," going desert.

This pessimistic view is subjected to damaging scholarly dissection by Dr. Isaiah Bowman, director of the American Geographical Society and vice-chairman of President Roosevelt's Science Advisory Board. (*Geographical Review*, Jan.) He cites evidence from many angles—glacier retreats, lake levels, tree rings, sunspot numbers—that the drought period of recent years has been only another downswing in a long, long story of climatic ups and downs.

Dramatic among evidences that "it hath been already of old time" are wagon tracks made by the Forty-Niners and others across the bed of Goose Lake, on the Oregon-California boundary, revealed now for the first time since the other earlier drought that permitted this American Exodus to cross, dry-shod, the southern end of this barrier sea.

Cycles there undoubtedly are in our climate, but as yet no man knows their beat, so that any but the most general predictions are unreliable. Nevertheless, says Dr. Bowman, "it can be predicted with complete assurance that members

of Congress will rise thirty, forty or fifty years from now and claim against the shortsightedness of the legislatures and leaders of 1934-1935 who talked as if the whole West were becoming a desert once more."

Whether we are in the distressful phase of retreat or in the optimistic phase of a re-advance on the climatic upswing, it is a mistake, in Dr. Bowman's opinion, to over-simplify our problem, to try to understand it and solve it without taking all factors into consideration. He says:

"It is sometimes assumed that the answer to the question of so-called permanent settlement in areas of risk is to be found in economic conditions alone or in physical conditions alone. Only the amateur can think this way. Physical conditions and economic and social conditions dovetail. All economic opportunities rest in the last analysis on the land and its wealth in the form of agricultural soil fertility, minerals, grass and forest growth, and water supply.

"The climatic facts alone are not going to decide which parts of the West will be permanently inhabited. Those submarginal areas that have lowest reliability of rainfall and that have the poorest soil and the roughest surface and lie farthest from transportation lines should be abandoned first of all.

"The word 'abandoned' is used only in a relative sense. Such areas may have

land suitable for grazing if not for grain."

Hazards of living on these marginal lands can be reduced by various methods of amelioration, such as dam building and tree planting, Dr. Bowman points out. The effects of these, he says, "encourage us to believe that we are on the right track when we extend these beneficent operations in places or within areas where scientific studies indicate the greatest possibilities of success and where the population can profitably remain if the risk be reduced."

*Science News Letter, April 6, 1935*

#### PHYSIOLOGY

## Heavy Water Molecules Trace Water in Body

WHEN YOU take a drink of water half of it is still in the body after nine days. And the average time a water molecule stays in the body is thirteen days.

This is the summary of investigations making use of heavy water for physiological studies of the water content of the human body developed by Prof. Georg von Hevesy and E. Hofer of the University of Freiburg in Germany.

Heavy water is the combination of oxygen and the isotope of hydrogen known as deuterium. For deuterium's discovery Prof. Harold C. Urey of Columbia University recently was awarded the 1934 Nobel Prize in Chemistry.

Because heavy water molecules can be distinguished by physical tests, although inseparable chemically from ordinary water, they can act as "tracers" in studying how the body eliminates water. Previously physiologists have never been able to make exact tests of how long the water in any particular "drink" stayed in the body.

Half the original quantity of water taken into the body is lost in from eight to ten days, report the scientists. The average time a water molecule spends in the body is from eleven and one half to fourteen and one half days.

"To explain this comparatively long time," state Prof. von Hevesy and Mr. Hofer, "we have to assume that most of the water taken becomes completely mixed with the water content of the body."

The scientists were able to make estimates of the amount of water in the body. Their value of from 59 to 67 per cent. is in fair agreement with known data.

*Science News Letter, April 6, 1935*

## CLIMATOLOGY

# Drought Still Holds Empire In West, From Coast to Plains

**Rainfall Less Than 50 Per Cent. Normal in Two Areas  
Large as Maine; Dust Storms Breed Where Rain Failed**

AS THE 1935 growing season gets under way drought still holds an unshaken grip in a wide empire in the heart of the Great Plains country of the West.

Last year, for the eastern part of the United States, the drought was something in the "distant" midwest. Coming simultaneously with the Federal crop curtailment program the drought of last summer has forced into everyone's mind its significance. No one can overlook rising food costs.

And along with price rises have come the recent dust storms bringing crop damage to the more favored lands eastward and plenty of midwestern, drought-formed dust into the homes along the Atlantic seaboard. These dust storms have been the "shock troops" making sorties from the citadels of drought desolation.

Study of a special map prepared by the U. S. Weather Bureau, showing conditions as of the end of March, discloses two "provinces of death," each of them almost as large as the state of Maine, where there has been no rain worthy of the name for more than a year. One of these is eastern Colorado, overlapping into western Kansas, the other is in eastern Oregon and Washington. In both these areas, the rainfall since the first of January has been less than 50 per cent. of normal—and this in country where "normal" rainfall would itself be considered a drought in the more humid East.

### Washington to Kansas

Surrounding these driest spots on the map, and connecting them in a broad isthmus, is a far larger area in which the precipitation so far this year has been, at best, only 75 per cent. normal. This extends from western Washington and Oregon to central Nebraska and northeastern Kansas.

A notable loss from the Drought King's domain, however, has taken place in the Northwest. Late winter and early spring snows and rains have removed most of Montana and both Dakotas from

the list of extreme drought states, at least for the time being. Though still moisture-deficient, they have as yet enough water to "get by."

One thing that makes the plight of the drought-cursed areas all the worse is the bad start they are getting for an uncertain summer. Last year there was above-normal precipitation in the West before the beginning of the growing season. The rainless summer sucked this all out of the ground, leaving the subsoil bankrupt. And this bankruptcy has continued, in constantly aggravated form, until the present time.

### Hope for Summer

One ray of hope, however, shines through the dusty murk of the western skies. This whole region is a summer-rain area; at least 80 per cent. of its rain falls during the actual growing season. So even a desperately dry winter can be followed by a reasonably good summer. The light precipitation that has partly lifted the curse in Montana and the Dakotas may just possibly be the promise of better things to come.

Drought seems to have abdicated com-

pletely to the eastward where Plains merge into Prairies and wheat gives way to corn as the dominant crop. Through the whole Corn Belt, where lack of rain caused widespread damage last summer, there was a very wet autumn and a normally snowy winter, so that the depleted subsoil is largely replenished. And the early spring rains have been all the way from normal to 25 per cent. better than normal.

In general, while western wheat still knows its withered tyrant, midwestern corn bids fair to hold its old freedom.

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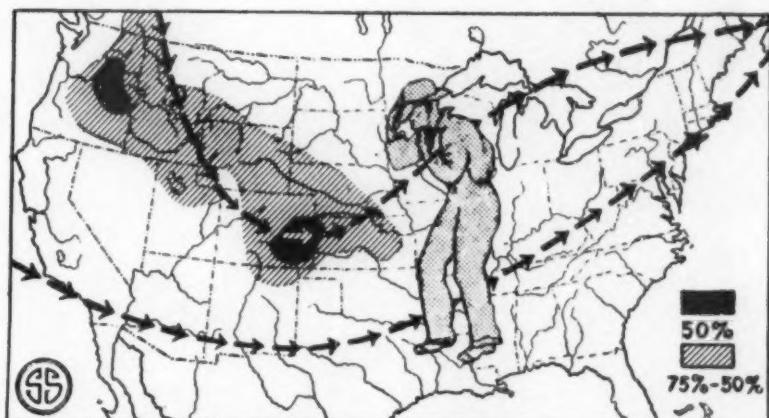
## METEOROLOGY

### Drought Menaces Irrigation Areas East of Rockies

DROUGHT on the irrigated lands of the eastern slope of the Rocky Mountains seems in prospect for the summer of 1935, a survey by the Department of the Interior indicates. In this region the soil has been moisture-deficient for so long that any rains falling now will be needed to replenish subsoil water, and there will be that much less for reservoir storage. Water shortages are likely to occur on the Uncompahgre project in Colorado, the Belle Fourche project in South Dakota and the North Platte project in Wyoming.

Elsewhere, however, especially in the Southwest and the Pacific Coast states, irrigation water supplies promise to be fair to good. An exception is the Carlsbad project in Texas, where the supply threatens to be short.

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DROUGHT'S EMPIRE

As the 1935 growing season gets under way, there is a wide zone still gripped by drought, which raises little but dust storms. The black areas shown on the map have had less than half their normal rainfall so far this year; the shaded portion from 50 to 75 per cent. normal precipitation. Arrows indicate typical paths of storms, which when they cross the dry regions pick up the soil and carry it for hundreds of miles as choking dust.

## PHYSICS

# Cosmic Rays Not Likely To be Future Power Source

**C**Osmic rays, as sources of industrial power, must join split atoms in the limbo of impracticable dream-schemes. Justification for cosmic ray investigations must be found in their value as aids in our better understanding of the universe, and the eventual better conduct of life.

This was the basic philosophic theme of an address on cosmic rays delivered in Washington by Dr. Thomas H. Johnson, researcher at the Bartol Foundation, Swarthmore, Pa., under the auspices of the Carnegie Institution of Washington, of which he is also an associate.

"The total energy falling upon the earth's surface in the form of cosmic radiation is about one thousandth that of starlight, one billionth that of sunlight," said Dr. Johnson. "If the cosmic ray energy were equal to that of sunlight, the latter would still prove to be the better source of power, for the extreme penetrating ability of the cosmic radiation prevents its concentration for conversion into useful forms of work."

All evidence points to regions beyond the atmosphere as the source of the cosmic radiation, the speaker declared, mentioning that when the detecting instruments used by many investigators in widely separated regions of the earth are pointed horizontally the number of rays detected falls to a very small fraction of the normal vertical-ray count. Furthermore, the higher instruments are carried in balloons, the greater is the cosmic ray registration: on stratosphere flights a 300-fold increase has been recorded.

Intense electrical fields, somewhere in the universe, were suggested as the most likely sources of cosmic rays by Dr. Johnson. He said:

"Accustomed as we are to electrical displays during thunderstorms and volcanic eruptions it is easy to imagine similar processes taking place on stars. Negatively charged clouds of dust or vapor high above the surface of a star could draw from its atmosphere positively charged atomic ions and project them, like the beam of a cathode ray

oscillograph, into cosmic space. Nuclei of hydrogen and helium atoms, the principal constituents of stellar atmospheres, would thus become the cosmic rays.

"During their passage through interstellar space small quantities of matter would be encountered in which secondary positive and negative electrons would be generated. The electron component could thus acquire a new significance as an indication of the amount of matter through which the primary protons have traversed before reaching the earth."

*Science News Letter, April 6, 1935*

## AVIATION

## All-Metal Airplanes Not In Danger from Lightning

**G**EAMING all-metal airplanes riding through storm areas are in little danger from direct lightning strokes. Should a bolt of lightning strike a metal plane its effects would be much less serious than in a plane of wood construction. Such are the conclusions just reported to the British Air Ministry by Dr. G. C. Simpson of the Meteorological Office.

Since 1925 ten cases of aircraft struck by lightning have been reported to the British Air Ministry but in each case no serious damage was reported. There is no authentic record of an airplane ever coming to disaster because of a lightning discharge.

That metal planes are safe in lightning storms, at least from damage by the lightning itself, has been checked by Dr. Simpson. He has found that the average bolt of lightning will not quite raise a round wire of one-half-inch diameter from its normal temperature to the boiling point of water.

Since a metal airplane is electrically conducting and bonded together by many metallic bands whose total cross section is usually more than that of one-half inch iron wire, there can be little danger of fire from the lightning strike, Dr. Simpson concludes.

Even a dirigible is much less vulner-

able to lightning than is popularly supposed. Its intricate and large metal framework provides an easy path for the passage of the electricity in a lightning stroke.

The danger from lightning is more serious when the object struck does not have such good conducting properties, as in the case of an airplane of wood construction. In this type the lightning bolt strikes one part and then has to jump through air to another. At each jump powerful sparks occur which have sufficiently high temperatures to ignite almost anything inflammable.

Lightning has a high voltage estimated at millions of volts. But passengers in an airplane struck by such a lightning bolt suffer no ill effects. It is possible to charge up the human body to very high electrical potentials if it is kept insulated.

In the great high voltage generator at Massachusetts Institute of Technology, for example, scientists sit atop tall insulating columns inside spheres charged to 5,000,000 volts. As long as they are safely insulated from the ground all is well. So far the insulation has held up. Persons in an airplane thousands of feet above the ground are much more safely insulated.

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## PHYSIOLOGY

## Carbon Dioxide May Help High Altitude Flyers

**B**Y INHALING small amounts of carbon dioxide with the air they breathe passengers in transport planes, altitude flyers and mountaineers could be protected from the discomforts of high altitudes, concludes a group of Yale University physiologists from recent tests on Pike's Peak. The illness due to the lack of oxygen high above the earth is known as mountain sickness. The experiments are reported by Prof. Yandell Henderson, Samuel B. Childs, Jr., and Hannibal Hamlin. (*Nature*, March 23)

Mountain sickness is a form of suffocation due to the diminished partial pressure of oxygen at great altitudes. While deficiency of oxygen in the blood is the cause of the trouble, supplying more oxygen to the lungs will not correct it. Earlier studies of Prof. Henderson showed that carbon dioxide, thrown off from the lungs as waste, is a natural and necessary stimulus to the breathing process. New-born babies that fail to breathe and persons whose breathing

has been stopped by drowning, gas poisoning or other accident have been helped back to normal breathing by inhalations of carbon dioxide mixed with oxygen.

The lack of oxygen obtainable at high altitudes causes overbreathing and as a result, a deficiency of carbon dioxide, Prof. Henderson has long concluded.

His point was proved by the recent tests on Pike's Peak.

These were made on five young men who had been at the summit long enough to be used to the altitude. Wear-

ing a mask open to the air and also connected with a small tank of carbon dioxide, these young men walked 250 yards up the cog railway, grade 1 in 5, in two minutes. The work amounted to lifting the body and the eight-pound apparatus 150 feet vertically. They made the test twice, once inhaling the carbon dioxide and once without these inhalations.

"None felt either the exertion or the respiratory strain to be at all increased by the inhalation, but rather the contrary," the Yale physiologists report.

*Science News Letter, April 6, 1935*

#### BACTERIOLOGY

## Body Tissues Not Germ-Free; Bacteria in Dissociated State

WITHIN a few minutes after birth, the blood and every normal tissue of the body are invaded by the ordinary bacteria found on the skin and in the mouth and nose, Dr. Lars F. Gulbrandsen of the University of Illinois College of Medicine has found.

This discovery upsets the prevailing idea that the blood and tissues of the body are as a rule sterile, that is, free from micro-organisms. Dr. Gulbrandsen finds the bacteria present in a changed form and believes that this change constitutes one of the body's means of defense against disease.

So far there has not been time for other scientists to confirm Dr. Gulbrandsen's findings and theories, but his study is said to open a new field in the investigation of disease and resistance.

The bacteria come to the tissues through the wall of the intestinal tract from food that has been taken through the mouth, Dr. Gulbrandsen believes.

New-born guinea pigs, he found, did not have bacteria in their body tissues at birth. But within fifteen minutes after feeding them pure cultures of bacteria by mouth, the micro-organisms could be found in the animals' tissues.

The bacteria, however, had undergone decided changes of a type known to bacteriologists as dissociation changes. They had no power to produce disease in the healthy individual and would not grow under ordinary cultural conditions.

It is this dissociation change which Dr. Gulbrandsen believes constitutes one of the body's major mechanisms of defense against disease.

Further work is being done to learn whether the bacteria pass through the lining walls of the intestinal tract intact or whether they are changed in that passage and can then return to their original form in the body tissues.

For this research Dr. Gulbrandsen was recently awarded the \$500 Capps prize of the Institute of Medicine in Chicago. This prize is given each year for the most meritorious medical research by a graduate of a medical school in Chicago completed within two years after graduation.

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#### ASTRONOMY

## Gaseous Nebulae May Be Ghosts of Exploded Stars

ARE THE great, misty nebulae seen by astronomers the ghost-shrouds of some prehistoric star which exploded as did now-famous Nova Herculis just before last Christmas? Scientists are asking themselves that question.

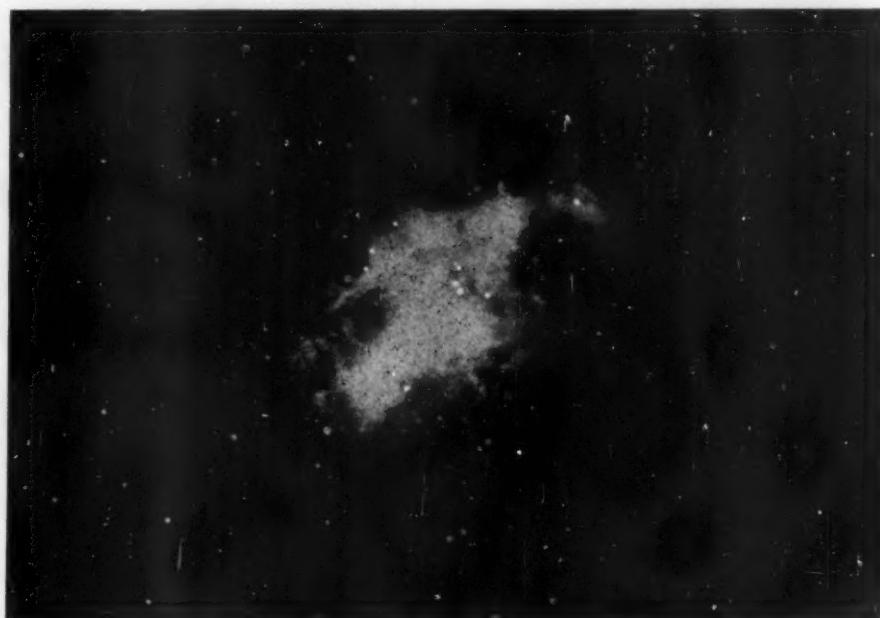
Dr. Gustaf Strömgberg of Mt. Wilson Observatory, in a summary of exploding stars written for the Carnegie Institution of Washington, points out one case, at least, which links the appearance of nova stars with the great nebulae so prevalent in the heavens. Dr. Strömgberg says:

"In the sky there are certain objects whose appearance and spectra are similar to those of the later stages of a nova. It is quite possible that all of these bodies have gone through a nova stage."

"A peculiar case is that of the so-called Crab Nebula in the constellation Taurus. By comparing photographs taken from time to time we have found that the nebula is gradually expanding. By calculating the time required to reach its present dimensions at a uniform rate we find that the hot gas must have left the star's surface about 900 years ago."

"In the records there is only one account of a nova star in that part of the sky in which the Crab Nebula is located. Chinese astronomers saw a nova there in the year 1054!"

*Science News Letter, April 6, 1935*



CRAB NEBULA OF TAURUS

## ICHTHYOLOGY

## Expedition Enters Mayan Jungle to Study Fish

THE TREK into practically unexplored jungle country where once Mayan Indians lived, has been begun by the University of Michigan zoological expedition to Guatemala. Along upper reaches of the San Pedro River the zoologists will seek rare fishes and mollusks, in an effort to learn more about the animal world and the foods of the great Mayan population, once scattered through the region in cities and villages.

The expedition is part of the program in which various sciences are focusing their specialized knowledge to account for the Mayan civilization, which was the highest and most remarkable of any attained by Indians in the New World. Dr. Carl Hubbs and Dr. Henry van der Schalie are joint leaders of the zoological party.

*Science News Letter, April 6, 1935*

## DIETETICS

## Too Much Cereal May Spoil Child's Appetite

THE PRESCHOOL child who has no appetite and dawdles over his meals may be getting too much bulk in his diet, and specifically too much cereal. This is the conclusion of a study made by Amy L. Daniels and Gladys Everson of the State University of Iowa.

"A diet bulky with cereals may satisfy a child's desire to eat before he has obtained all the elements he needs for growth and activity," comments the editor of the *Journal of Home Economics* (January) in which the scientific details of the study appear.

Lack of outdoor exercise and of vitamins, overfatigue and irregularity of meal times have all been considered as contributing to lack of appetite in the run-about child under school age, but in the Iowa study these factors were all carefully ruled out. The children all lived under the same conditions except for the kind of food they were given. Differences between the children were also ruled out by having the same child eat one kind of diet for sixteen days and then switch to the other kind.

The length of time spent in eating was used as the criterion of how the diet affected the child's appetite. When the children were fed the bulky diet contain-

ing the amount of cereal usually recommended for this age group, they took much longer to eat than when they were fed the less bulky, low-cereal diet.

One child never took longer than twenty minutes to eat breakfast while on the low-cereal diet but spent as much as three-quarters of an hour over this meal when on the high-cereal diet.

The only differences in the diet were in the bulk and the amount of cereal. The high-cereal diet was almost twice as bulky as the low-cereal diet. This factor of greater bulk resulting from larger amounts of cereal is considered a partial explanation of poor appetite in children of this age.

*Science News Letter, April 6, 1935*

## MEDICINE

## One Every 4.42 Seconds Enters Hospital Doors

ONE every 4.42 seconds—that is the rate at which Americans enter hospitals.

They stay, on the average, 14 days.

When they leave, a good many take babies home with them; for 701,143 babies were born in the hospitals of the United States last year.

These are new data on hospitals issued by the Council of Medical Education and Hospitals of the American Medical Association. (*Journal American Medical Association*, March 30.)

As might be guessed, the medical association found that persons stay considerably longer in governmental hospitals than they do in independent proprietary hospitals. One person in seventeen made use of some type of hospital last year.

Never before in this country have there been so many idle hospital beds as there were last year, this annual survey shows; some 218,000 beds were unoccupied. However, hospitals showed a business gain, for the length of patient stay so increased that institutions for the sick had a gain of 7,000,000 patient days over the previous year.

The hospital department of the association disagrees with the recent Alden B. Mills study which declared that there is a need for more rural hospitals. It is pointed out that rural hospitals had more unoccupied beds last year than had city hospitals. The proportion was 50.2 per cent. beds occupied in 2,003 rural hospitals against 62.4 per cent. beds occupied in 2,031 city hospitals.

*Science News Letter, April 6, 1935*

# IN SCIENCE

## GEOLOGY

## New Spring Discovered in Hot Springs National Park

THE HOT Springs National Park has a new hot spring, one which will add approximately 25,000 gallons a day to the Park's supply of hot waters. The spring itself is not new, but its existence underground has just been discovered in connection with excavations for the promenade development.

The temperature of the spring is 148 degrees Fahrenheit. Its waters will be collected and run into the general hot water system, from which the bathhouses are supplied.

*Science News Letter, April 6, 1935*

## MEDICINE

## Caution Urged in Using Snake Venom

ADMITTING that moccasin snake venom is a promising treatment to control bleeding, the American Medical Association warns physicians to use caution, even in experimental use of the powerful poison.

That moccasin venom, injected under the skin, controls various types of bleeding successfully is reported by Dr. Samuel M. Peck and Dr. Nathan Rosenthal of Mount Sinai Hospital, New York. (*Jour. American Medical Association*, March 30)

Unfortunately, the physicians have concluded, this snake venom has no influence on the particular problem of hemophilia, congenital disease afflicting males of a royal line in Europe, as well as others. This disease is characterized by delayed clotting of the blood.

Commenting on the report which shows that moccasin venom has given a favorable response when other standard methods of curbing bleeding failed, the Association, through its council on pharmacy and chemistry, urges physicians to select the type of cases carefully for this treatment, and to watch for local reactions.

*Science News Letter, April 6, 1935*

# EE FIELDS

## ZOOLOGY

## Jellyfish Deadly Enemies Of Small Marine Fishes

JELLYFISH, though the popular synonym for flabby spinelessness, are by no means harmless. They capture and devour baby fishes of all kinds in great numbers, says Dr. E. W. Gudger of the American Museum of Natural History, in the *Bulletin of the New York Zoological Society*. One specimen was kept under observation in an aquarium, and in six weeks ate a couple of dozen tiny fish.

Other species can capture and devour fish much larger than themselves. One, which Dr. Gudger describes, pulled itself over its catch like a mitten over a hand. Another, in its eagerness to get its stomach around its victim, literally turned itself inside out.

*Science News Letter, April 6, 1935*

## METALLURGY

## English Goldsmith Revives Lost Etruscan Bead Art

OLD beads so tiny that a row an inch long would contain a hundred of them figure prominently in the intricate jewelry of the ancient Etruscans, who thrived in Italy before the rise of Rome. But the making of them became a lost art.

Now an English goldsmith named Blackband is able to make them again, by a process which he believes is identical with that used by the long-dead early masters of his craft.

Mr. Blackband's rediscovery was more or less accidental. He spilled a small quantity of molten gold, which splashed at it fell. When he gathered up the scattered precious metal, he found that the smallest drops had hardened into perfect little spheres. Now he purposely splashes molten gold-copper alloy onto a sloping shelf in a little box, and turns out "Etruscan" beadlets in quantity.

The next problem was to find out how to form them into the complicated patterns of double lines, hexagons and triangles such as figure on Etruscan jewelry. This proved to be not particularly

difficult. Drawing a wet line with a finely pointed camel's-hair pencil, Mr. Blackband saw his beads range themselves in rows along it, held by the surface tension of the water.

Then he used a wet hair-fine wire. The beads adhered to the wire. He bent it into the desired pattern, the beads still sticking in place, and then heated it until the wire and beads fused together. Now he can duplicate any Etruscan pattern.

*Science News Letter, April 6, 1935*

## PUBLIC HEALTH

## U. S. Children Largest in Northeast, Smallest in West

CHILDREN from the northeastern section of the United States are, on the whole, the largest and those from the western section are smallest, officers of the U. S. Public Health Service found in a study of body build of children throughout the country.

The study was limited to children of native white parents and grandparents, living in four different sections of the country. The northeastern section included the New England and Middle Atlantic States and the western section was limited to Utah and Nevada. Second largest children were found in states bordering the western Great Lakes. Next smallest were the children in a south central section extending from Kentucky to Texas.

The stockiest children come from the northeast section; those of intermediate build from the north-central and south-central regions and the least stocky from the western area. Differences in weight between children of the same age and sex in different regions were greater than differences in height. Fourteen-year-old boys from the Northeast weighed on the average nine pounds more than those from the West but were only about an inch taller.

*Science News Letter, April 6, 1935*

## ICHTHYOLOGY

## Fish Painting In Bingham Collection

THE painting reproduced on the cover of the SCIENCE NEWS LETTER for March 9 is part of the Bingham Oceanographic Collection of the Peabody Museum of Natural History, Yale University, and not in the Buffalo Museum of Science, as originally stated. When the painting was photographed, it was on loan at the Buffalo Museum.

*Science News Letter, April 6, 1935*

## ASTRONOMY

## Old Photographic Telescope Re-Used to Study Stars

THE PLEIADES, or "Seven Sisters," are not so sisterly as their name might indicate. New measurements with an ancient photographic telescope show them to be moving apart, going their separate ways, despite current astronomical ideas.

This discovery was announced by Prof. Jan Schilt, of the Columbia University department of astronomy. It is the result of the comparison of photographic plates made 67 years ago with similar plates made recently. The angular motion between the six visible and many lower-magnitude stars composing this familiar group is so small, however, that Prof. Schilt likened it to the movement of two inches in 100,000 years by an insect on 42d Street as it would appear to an observer on top of the Chrysler Building.

To make the new set of plates duplicate the old as nearly as possible, Prof. Schilt resurrected from a museum the old telescope originally used. It was made in 1868 by a Mr. Rutherford, an old-time trustee of Columbia University, and had long since been retired from use. However, with a new plate holder and specially made plates to give as nearly as possible the same effects as the old plates, it functions as well as ever.

*Science News Letter, April 6, 1935*

## BOTANY

## Famous Cherry Blossoms Early This Spring

See Front Cover

WASHINGTON'S famous Japanese cherry blossoms reflected the coaxing warmth and moisture of mid-March by blossoming a full two weeks earlier than usual. They were opening up rapidly on Friday, March 29, and by Sunday, the last day of the month, were in full glory. As a rule they do not reach their climax until about mid-April.

Penalty was exacted, however, for their precocity. Just as the trees had assumed the appearance of enormous fluffy snowballs, a stinging cold rainstorm swept over the city.

Some consolation, however, is to be expected; for this first burst of bloom, the single whites, is to be followed at short intervals by several other varieties of Japanese cherries, double whites and pinks, declared by some devotees to be even lovelier than the first flowers.

*Science News Letter, April 6, 1935*

## PALEONTOLOGY

# When Sharks Ruled the World

## Wyoming's "Lost World," Reconstructed From Fossils, More Fantastic Than Conan Doyle's Great Tale

By DR. FRANK THONE

SIR ARTHUR Conan Doyle achieved the climax of his fantasies when he told the tale of the "Lost World"—of a party of explorers finding, in an isolated spot in the tropical jungles, a relict population of the Middle Ages of the animal world: lumbering, spike-toothed dinosaurs, swooping, leather-winged pterodactyls. The book was a thriller, and the ingeniously contrived movie built around it was a classic of its time in the films.

But Sir Arthur's imagination, bold as it was, made only a half-hour's hike into the geological past, when we compare it with the expedition into a "Lost World" of the earth's real antiquity made not so long ago by a young scientist from Princeton University. Conan Doyle's dinosaurs lived only a matter of 120 million years ago. The creatures of Dr. Erling Dorf's discovering played their parts in the everlasting drama of devourer and devoured at least three times that far back on the old earth's calendar.

### An Authentic Record

Another point must be claimed in favor of Dr. Dorf's world of weird monsters: it was not simply imaginary; it had a real existence and left a real record. Hundreds upon hundreds of its creatures, when they died, left the imprints of their bodies in soft ooze that has since turned to solid stone. These records are as definite and authentic evidence of life in a community of the past as are the imprints of Babylonian seals on old clay tablets, or the carved hieroglyphs on an Egyptian prince's tomb. Men who can read these cryptic writings pressed into the lasting pages of the rocks find them every bit as fascinating as any product of literary fancy, with the added zest of knowing that these things actually happened.

Their existence was real, and their place was no less real. Out in sun-drenched, wind-swept Wyoming, a little less than twenty miles east of Yellowstone's plateau of wonders, there rises an impressively massive citadel of rock, dominating the plain as a battleship turret dominates the deck. This is Beartooth

Butte. It is a kind of an immense geological layer-cake, for it consists of massive stratum on stratum of rock of different geological ages, standing high above a terrain made of some of the oldest rocks in the world.

Once there was no Beartooth Butte. The level of the country was higher than its top in those remote days, and the layers that make it up continued in all directions as parts of the foundation of the land. Then, through slow ages, water and weather ate away the land, leaving only round-sided massive fragments standing here and there. These are the buttes—among them Beartooth.

### Readers of the Rocks

To the exposed edges of their piled strata come geologists, reading them as we read the pages of a somewhat puzzling but irresistibly fascinating book. The words are fossils, the punctuation marks are the cracks and discontinuities in the rock. The chapters are scores and hundreds of millions of years of life on earth.

Geologists had come to Beartooth Butte before, read their chapters and went their ways. Then Dr. Dorf and his companions came, and found an entirely new chapter that nobody had seen before. They were to have all the fun of reading it for the first time.

This chapter was found between the banks of what had once been a mighty river mouth, carved in the shores of an ancient continent, and then sunk partly below sea level to form an estuary, like the wide course of the lower Potomac that has its upstream end at Washington, D. C.

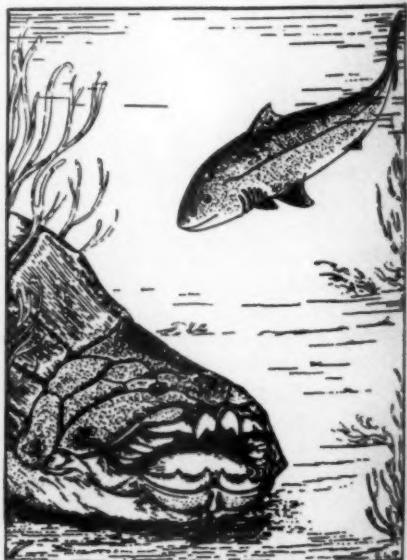
In an estuary, the slow down-flowing current must always strive against periodic up-flowing tide. This makes for slack water, a good deal of the time, so that sand and silt carried by the water will settle to the bottom, and in the end will choke up the channel. Whatever falls into this bottom ooze gets sealed in and stands a very fair chance of becoming a part of the permanent geological record. If you were to dredge up a lot of Potomac mud, for example, you would find in it the bones and scales of the fish

and other water animals that swam there in the recent past. You would also find stray evidences of drowned land life: bits of waterlogged wood and leaves, a tin can, a dull safety-razor blade. You would have a record, albeit perhaps a scrappy one, of the life in the river and along its shores.

Dr. Dorf's filled-up ancient estuary yielded just such a record of the life in this forgotten river and along its banks, a third of a billion years or more ago, in that remote age of the earth's history which geologists call the Devonian, because the rocks of that age were first recognized and studied in Devonshire in England.

The Devonian has been called the Age of Fishes, because at that time no higher forms of backboned animals than fishes are known to have existed. The seas swarmed with animal life then as they do now. There were many strange, often terrifying creatures in the water, which have long since died out completely, leaving no near relatives. There were also others, particularly among the fishes, that have modern surviving kin.

Plants grew in the water—seaweeds. Plants grew on land also, but they were of kinds we would hardly recognize now, save that a few looked rather like the horsetail rushes that grow along railway tracks and in wet sandy places, and others



DINICHTHYS

*He of the bear-trap jaws, lying in wait on the bottom. Restoration drawing by Carroll Lane Fenton.*



### DEVONIAN FISHES

*These particular forms swam the ancient seas over the land that is now Scotland; but the fishes of Dr. Dorf's "Lost World" in Wyoming were quite similar to them. From a restoration in the American Museum of Natural History.*

remotely resembled ferns. Of animal life on land, however, there is hardly a trace. Plants were either much more venturesome than animals in going ashore, or else the animals on shore leave died without leaving any last testimony. Dr. Dorf suggests that since animals depend upon plants for subsistence, therefore plants had to become established before animals could take advantage of the land habitat.

This then was the setting for Dr. Dorf's "Lost World" that lived in a sunken river when the earth had not yet grown old. Under the dim waters swam and crept ghostly, cruel fishes, and monsters, shell-armored and claw-armed, that looked like nightmares of giant lobsters. Shovelling in the mud for a living were other shell-backed things that were neither backboned fish nor backboneless crustaceans. They may possibly have been the great-great-great-grandparents of fish (and hence of all the rest of us proud vertebrates), living on like "contemporary ancestors" among their more progressive descendants. One may wonder a little if the fishes of those days were vaguely annoyed by their reproachful presence, as some of us are, sometimes, by the appearance of our poor cousins, the apes.

#### A Complex Society

There was enough variety in the community of Beartooth Estuary to give the social structure some complexity. Dr. Dorf's list comprises a total of 29 species of animals of many kinds. They were identified for him by Director William L. Bryant, of the Park Museum, Roger Williams Park, Providence, R. I.

When you get so many different life forms all in one place, each kind of animal with its own habits and needs and ambitions and fears, life is apt to be

reasonably lively. There will be the active, the aggressive, the rapacious, exercising boldly the right of the strongest. There will be the sly, the furtive, the creeping, watching for opportunity to stab or strangle in the dark. There will be the patient, the meek, of manifold birth and rapid growth, seemingly made for the role of unresisting victims. We have them in our cities, they are known among the beasts of the field and the birds of the air; and their types were not lacking in the "Lost World" of Erling Dorf.

There were, for example, sharks—six kinds of them. They were not identical with any species of shark that swims the seas today, but we should have had no difficulty in recognizing them for what they were.

#### Corsair Conservatives

These lithe, restless corsairs of the sub-seas world would have been, most probably, the easiest to recognize among all the inhabitants of Beartooth Estuary. Like many other gentlemen of excessive appetites and deficient ethics, sharks are conservatives; they have changed little in a third of a billion years.

Another conservative among the fishes was a lone lungfish. Only one specimen was found: apparently a solitary aristocrat in this turbulent aquatic community of the Old Wild West. There are lungfishes still in existence, in out-of-the-way places of the world: interior Africa and Australia, and a limited area in South America. They are really a bit pathetic; the lungfishes are and apparently always have been rather inoffensive creatures, asking only for mud to burrow in and a little air to breathe—for lungfishes are unique among their kind in that they use their airbladders as genuine lungs, as do land-living animals; though they are not

regarded as ancestral forms. The lone lungfish of Beartooth Estuary doubtless had companions, but thus far no scale or tail of them has been found.

But when we leave the company of the sharks and the lungfish, we are at large in a "Lost World" indeed. All the other 22 species of animal life represented in Dr. Dorf's collections are unlike anything that now lives in the waters that are under the earth.

There is still a third group of fishes, much more numerous in individual remains than either of the other two, but no fish of this order now exists, or has for many millions of years. They bore the harsh name of arthrodires, and they were the heavy armored barons of the Devonian watery world. They were enclosed in heavy bony plates instead of the flexible scale coats of modern fishes, and some of them had terrific shear-like jaws. Burdened with armor as they were, it is unlikely that they were very active; more probably they lurked on the bottom waiting for unwary prey to swim within snapping distance of those bear-trap jaws.

#### Sea-Scorpions

Among the animals without backbones the most conspicuous was a huge sea-scorpion, of which Dr. Dorf found just two specimens. These sea-scorpions were not so very closely related to the little sting-tailed land scorpions of today, but they were not closely related to any other living things, either. In external appearance they were more like enormous lobsters, or perhaps horse-shoe crabs, rather

flat-bodied and otherwise misshapen: some of them were as much as six feet long. Their claws, however, were disproportionately small, if we take the lobster as our standard of beauty.

The bulk of the population of the Lost World of Beartooth Butte, the common people of this aquatic settlement, was made up of smaller, shell-cased, wide-headed fish-like creatures that were not yet fish—the then contemporary ancestors, the ostracoderms. (That four-jointed word means "shell-skins," and describes them very neatly). These poor folk were the multitudinous meek of the Devonian "Lost World." They were bottom-creepers, mud-shovellers; they not unlikely lived on the scraps and leavings that fell from the tables of the sharks and the arthrodires. And in the end, they did not inherit the earth: the last ostracoderm perished ages ago, and the sharks are still with us.

That completes the census of the "Lost World" of Beartooth Butte, so far as animals are concerned. The story of the plants is told much more quickly. All plant remains found belong to one family of land plants, a strange growth with curled stem and no leaves, that probably grew on the marshy edges as cattails and reeds grow on the shores of estuaries today. They were of the group known as the psilophytals, earliest and most primitive of all land plants, and regarded by Dr. Dorf as the undoubted ancestors of all the manifold land-dwelling vegetation of later times.

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*Science News Letter, April 6, 1935*

British tests show that certain kinds of trees attain a diameter of only 4 inches after 16 years of growth in Scotland or Canada; whereas in Australia's climate such trees reach 12 inches in nine years.



BLOCK PRINTING

*A printer assists Miss Reeves in block printing a design adapted from art of Mayan Indians in Guatemala.*

ARCHAEOLOGY—TEXTILES

## Designers Borrow Patterns From Ancient America

TEXTILE designers are discovering ancient America.

In a search for novelty and inspiration, artists who pattern silks and other fabrics have struck upon the Guatemalan highlands, where descendants of the famous ancient Mayan Indians are still living. Ancestors of these Indians reached the highest peak of prehistoric American civilization, in architecture, art, and learning. The modern Mayas live simply but in their villages may be seen distinctive American art designs adorning shirts, skirts, headbands, blouses and

blankets. Some of the designs are old, traditional; others modern.

The wave of interest had its start last spring when the Carnegie Institution of Washington sent Miss Ruth Reeves, New York textile design artist, to Guatemala to study ancient and modern textiles and costumes. The collection of textiles which Miss Reeves brought back, and costumes collected by Edith Ricketson of the Institution staff, are now being shown at art institutes around the country, under auspices of the National Alliance of Art and Industry.

Thus modern science and art return a compliment which Indians paid to white men four hundred years ago—the compliment of imitating or borrowing. Indians, dazzled by Spanish costumes in their midst, adapted fashions and designs. The conventionalized double-headed eagle on Guatemalan Indian textiles may have been a borrowing from the Hapsburg coat of arms, royal emblem of the Spanish colonial official. So, at least some people have interpreted this Indian design; though others believe the two-headed birds to be a native art idea much older than Spanish Conquest days.

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The Indians borrowed, but they did not weaken their own vivid and individual art of color and design. In highland villages weavers still employ symbols of ancient Mayan gods and nature signs, and use symbolic colors that their ancestors used: yellow symbolizing food, color of corn; red for blood and sacrifice; blue for royalty; black for weapons of the shiny volcanic glass called obsidian.

From her study of Indian needlework and weaving, Miss Reeves and her associates have begun the process of adaptation, to show the public how Indian designs can be used. Designs from the Indian motifs have been worked into hand-

woven and hand-printed fabrics. Others have been put into machine production.

Practical use of the study is already evident. There remains another value in this showing of Indian art. Says the Carnegie Institution:

"It is believed that opportunity to see and examine this collection of superb specimens of the handiwork of these representatives of an ancient race will go far toward proving that the Americas have a cultural past which compares favorably in many respects with that of the first great civilized societies that developed in the ancient Near East."

*Science News Letter, April 6, 1935*

#### ARCHAEOLOGY

## Raise Pot Lid, Find Dinner Left on Stove 6,000 Years

Raising a cooking pot lid, archaeologists exploring the oldest city yet discovered in the world have found meat bones still in the pot, says a report just received from Tepe Gawra, Mesopotamia, by the University Museum in Philadelphia.

This uneaten dinner, left in the oven for 6,000 years, reveals how sudden was the downfall of Tepe Gawra's twelfth city, the oldest yet probed. A heavy layer of ashes and charred refuse shows that the city was burned, probably by its enemies.



AN AMERICAN EAGLE

Whether Indians of Middle America borrowed this two-headed eagle design from the Hapsburg coat of arms, or whether they invented the bird themselves long before Spaniards arrived in America, is controversial. This material from the village of Santo Tomas Chichicastenango, Guatemala, has the double eagle embroidered in red, yellow, and white.

This twelfth level is about three centuries older than the buried settlement found last month at Tepe Gawra, says the report from Charles Bache, field director, of the joint expedition to Tepe Gawra from the University Museum of the University of Pennsylvania and the American School of Oriental Research.

Mr. Bache expects to push the history of the site back through eight earlier levels, which are known to exist from exploratory trenches.

These nine earliest cities, including the one now being unearthed, were all built by "the painted pottery peoples," as the archaeologists call them. Striking geometric designs painted on clay household wares are the conspicuous badge of their culture. These "painted pottery peoples" are known to have swept like a conquering horde from the East over Persia, India, and Mesopotamia, some six thousand years before Christ. Tepe Gawra, with its long series of their cities, is counted on to reveal the customs, household crafts, architecture, perhaps the racial type of these little known city-builders of the ancient world.

Builders of the 4000 B.C. Tepe Gawra were still in the Neolithic or New Stone Age, totally unacquainted with metal implements, reports Mr. Bache. As recently as ten years ago it was believed that no Neolithic culture was to be found in Mesopotamia. The Stone Age city just discovered proves superior in architecture to the three settlements which followed it.

*Science News Letter, April 6, 1935*

#### PUBLIC HEALTH

## Says School Funds Wasted Without Health Care

THE POOR school work and low intelligence levels of children handicapped by physical defects, such as poor teeth and posture, are an argument for state medicine or some form of social insurance against sickness, in the opinion of Melissa Brafon Stedman of the Bell High School, Los Angeles.

Pouring money into education is sheer waste unless at the same time medical and dental care are provided so that students may be healthy enough to receive full value from schooling.

Her opinion regarding the need for attention to the child's health as well as his education is based on her findings in a survey of 450 high school pupils. Healthy children are more intelligent and get better grades than the physically handicapped, she found. Her report will be published in the *Journal of Applied Psychology*.

Over 91 per cent. of the group had one or more health defects and the average grades of these pupils were only 76 per cent of the average attained by the healthy children. There was also a difference of 4 points in intelligence in favor of the healthier pupils. Despite their abilities the children with no physical defects were distinctly in the minority. There were only 39 of them.

Rating second with respect to grades were 312 children with postural and orthopedic defects. They dropped to fourth place in intelligence while the 128 possessing defective tonsils and

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adenoids took second place in mental level. The lowest average both in grades and mentality was shown by the group having defective lungs.

Defective teeth are almost as detrimental to school progress as weak lungs and they are more often found. Thirty per cent. of the whole group had them and the grades of pupils so affected indicated that they were getting only 64.5 per cent. of the potential value of their education.

The low accomplishment on the part of the physically handicapped children holds good for each group at each intelligence level. The very bright children, however, are more affected by bad teeth than are those who are just average since the mentally superior have more sensitive nervous systems.

*Science News Letter, April 6, 1935*

#### ASTRONOMY

### Sun's Probable Age Ten Million Million Years

THE outside limit of the probable age of the sun is ten million million years, according to Dr. Donald H. Menzel, of Harvard College Observatory, in an address for Science Service over the Columbia Broadcasting System.

In the report of Dr. Menzel's address in SCIENCE NEWS LETTER of March 30, the probable age of the sun was erroneously reported as 500 sextillion years. This figure in Dr. Menzel's address referred to the energy liberated by the sun from its surface as radiation and not to the probable age of the sun.

*Science News Letter, April 6, 1935*

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ICHTHYOLOGY

**NATURE RAMBLINGS**  
*by Frank Thone*



#### Fish Can Be Drowned

ISN'T it odd, that a fish can be drowned?

Or maybe it isn't so odd after all, when you consider what a fish is, and what it must do to remain alive.

A fish is an animal—as much so as a cow or canary, a toad or a turtle, or any other creature that walks or hops on land and breathes air with lungs.

Land-living animals breathe air for one prime necessity: oxygen must somehow be sent to all the cells of their bodies, there to unite with food substances in the low-temperature combustion we call life. Stop either oxygen or food, and you stop life.

In all land-living vertebrates, or backboned animals, the oxygen is carried to the cells by the red blood corpuscles. In insects and their kin, the oxygen is carried in another way—but that is another story. The central fact is that the oxygen simply must reach the cells.

The cells of fish, and of all other water creatures as well, have this same impulsive need for oxygen. Fish, like their backboned "rich relations" of the land, depend on red blood cells to carry the oxygen.

But where is the oxygen to come from? You can see the answer if you warm up a little common tap-water. Before it is hot enough to start giving off steam bubbles, little bubbles of air rise to the top and escape. Oxygen—and the other air gases—are in solution in all natural waters. Fish can take out this dissolved oxygen from the water with their gills, as we take oxygen out of the gaseous mixture we call air with our lungs.

When a man or other air-breathing animal drowns, the real cause of death is oxygen lack—for our lungs are not so made as to take dissolved oxygen out of the water. Drowning is therefore really a form of strangulation.

Keep active fish in water without oxygen, and they, too, soon strangle. They are dead of drowning, as surely as a drowned man.

This drowning of fish can take more than one form. The fish can be trapped in water wholly sealed in by ice, as when "anchor ice" forms across the bottom of a pond in a long cold spell. Or, in a hot and droughty summer, they can be caught in a dwindling pool, in which swarming animal life sucks out all available supplies of this life-element. You can even starve pet goldfish for oxygen by crowding too many of them into too little water, in a narrow-topped bowl.

*Science News Letter, April 6, 1935*

#### PSYCHIATRY

### No Rise in Serious Mental Disease During Depression

SERIOUS mental disease has not increased notably as a result of the depression. This fact, contrary to current belief, has been found in a study made during the past year by the National Committee for Mental Hygiene in collaboration with the American Psychiatric Association.

"This study shows no rising tide of hospital admissions that can be ascribed to prevailing economic conditions and reveals no striking increase in new cases or in total institutional populations," is the conclusion of the study made public recently.

The increases in number of cases of mental disease that were reported during the depression are not considered numerous enough to be significant and are thought due to increase in hospital facilities and in public confidence in hospitals for the care of the mentally ill. A substantial part of recent increase is thought due to exhaustion of family resources.

*Science News Letter, April 6, 1935*

## ORADIO

Tuesday, April 9, 4:30 p. m.

THE MINOR PLANETS: STRAY SHEEP OF THE SOLAR SYSTEM, by Dr. A. O. Leuschner, Professor of Astronomy, University of California.

Tuesday, April 16, 4:30 p. m.

THE MEANING OF MATHEMATICS, by Dr. E. R. Hedrick, Professor of Mathematics, University of California at Los Angeles.

In the Science Service series of radio addresses given by eminent scientists over the Columbia Broadcasting System.

# •First Glances at New Books

## Geography-Language

**IN FOREIGN LANDS; AN EXPLORATORY LANGUAGE COURSE AND CULTURAL INTRODUCTION TO ROME, ITALY, FRANCE, SPAIN, GERMANY** — Beth Hughson and Oda Gostick—*D. C. Heath and Co.*, 462 p., \$1.24. This unusual school book for junior high school age is the result of an educational idea which the authors have put into practice with children of all grades of ability during the past eight years. The four expressed aims of the course include the cultural one of teaching children at an impressionable age the difference in languages, nationalities, and environment; and the practical one of giving pupils a taste of several languages so that they may continue with those for which they have greatest liking and aptitude.

*Science News Letter, April 6, 1935*

## Botany

**GYMNOSPERMS, STRUCTURE AND EVOLUTION**—Charles Joseph Chamberlain—*U. of Chicago Press*, 484 p., \$4.50. Prof. Chamberlain puts into this book the fruits of a lifetime of research in the laboratories and greenhouses of the University of Chicago, and of field work in all the lands of the world where gymnosperms, and especially his beloved cycads, are to be found. Advanced students of the structure and evolution of plants need only to be told that this book has been published; no argument to establish its necessity in their work is called for.

*Science News Letter, April 6, 1935*

## Psychology

**WHAT MAKES US SEEM SO QUEER?**—David Seabury—*Whittlesey House*, 336 p., \$2.75. Written in "popular style" about the oddities of human nature.

*Science News Letter, April 6, 1935*

## Medicine

**PROBLÈMES DE L'HYGIENE ALIMENTAIRE**—J. A. de Loureiro—*Hermann et Cie., Paris*, 28 p., 8 francs.

*Science News Letter, April 6, 1935*

## City Planning

**OUTLINE OF TOWN AND CITY PLANNING**—Thomas Adams—*Russell Sage Foundation*, 368 p., \$3. "The modern city is very different from cities of the pre-industrial age, but it is nevertheless apparent that there is much we can learn from examining the methods of city planning and development in past times."

So wrote Franklin D. Roosevelt in December 1932, from the Governor's mansion, Albany, New York, in a foreword to this history of civic design, now published. The volume is encyclopedic, describing city after city, ancient and modern, and analyzing the aims and methods of modern planners. Numerous plans and photographs help the reader to grasp comparisons and understand evolutionary changes.

*Science News Letter, April 6, 1935*

## Botany

**THE STRUCTURE AND REPRODUCTION OF THE ALGAE**, VOL. 1—F. E. Fritsch—*Macmillan*, 791 p., \$8. A most thorough and painstaking study of the algae, with 354 text figures in line drawing. Each chapter is supplemented with a full literature list. The book is intended, of course, for special students; but it is invaluable to its relatively limited audience.

*Science News Letter, April 6, 1935*

## Photomicrography

**OPTICAL INSTRUMENTS FOR THE EXAMINATION OF METALS**—*Bausch & Lomb Optical Co., Rochester, N. Y.*, 115 p., free. (Obtainable through Science Service if 10c. handling charge is sent).

*Science News Letter, April 6, 1935*

## Sociology-Religion

**SOCIAL AND RELIGIOUS PROBLEMS OF YOUNG PEOPLE**—Sidney A. Weston and S. Ralph Harlow—*Abingdon Press*, 288 p., \$1.75. Problems for discussion in young people's church and other organizations with suggestions for source material.

*Science News Letter, April 6, 1935*

## Philosophy

**MIND, THE MAKER**—William Benjamin Smith—*Scripta Mathematica*, 31 p., 35c. This corrects the review in the *Science News Letter* of March 9, 1935, P. 159, in which the author was listed as Cassius Jackson Keyser. Dr. Keyser merely presented this essay, at a meeting of the Forum of the Friends of *Scripta Mathematica*.

*Science News Letter, April 6, 1935*

## Archaeology

**ARCHEOLOGICAL INVESTIGATIONS IN THE BAY ISLANDS, SPANISH HONDURAS**—William Duncan Strong—*Smithsonian Institution*, \$1.25. The culture of the Bay Islands and the adjacent mainland represents an extreme northern thrust of South American influence, is the conclusion of Dr. Strong. The report describes findings of a Smithsonian expedition of 1933 and an expedition of the American Museum of Natural History in 1931.

*Science News Letter, April 6, 1935*

## Ethnology

**RACE AND CULTURE CONTACTS**—Ed. by E. B. Reuter—*McGraw-Hill*, 253 p., \$3. What is happening in the world where race meets race is the theme of this book. Thirteen different authors discuss such topics as The Unorthodox Race Doctrine of Hawaii, American-born Orientals, Traditions and Patterns of Negro Family Life in the United States, and Conflict and Equilibrium in a Border Area. The papers included were originally given before the American Sociological Society at its twenty-eighth annual meeting.

*Science News Letter, April 6, 1935*

## Economics

**THE CHART OF PLENTY**—Harold Loeb and associates—*Viking Press*, 180 p., \$2.50. Arrives at the conclusion: "Production is cut to fit an inadequate buying power, instead of buying power (which can be raised or lowered at will) being raised to fit product capacity. This procedure can be likened to that of . . . Procrustes."

*Science News Letter, April 6, 1935*

## Geology—Astronomy

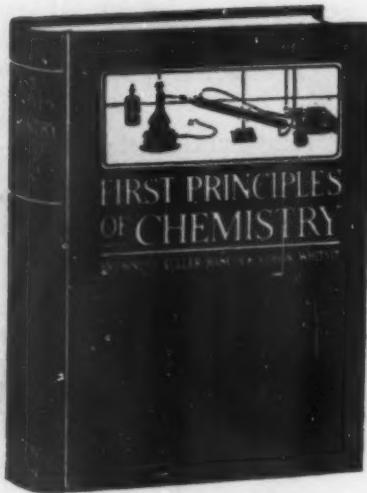
**THE STORY OF EARTH AND SKY**—Carleton and Heluiz Washburne in collaboration with Frederick Reed—*Appleton-Century*, 382 p., \$1.32. New student's edition of a splendid book on our earth's history and the elements of astronomy, for boys and girls. Illustrated with photographs, and delightfully animated line drawings by Margery Stocking.

*Science News Letter, April 6, 1935*

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# THE WORLD OF CHEMISTRY

**W**E LIVE our lives amid material things. To the understanding of this environment man has given centuries of toil and thought. Slowly superstitions have given way to scientific facts. Great minds have delved in obscurity to bring forth scientific principles. When these were numerous enough and became properly classified, the sciences of today came into being.



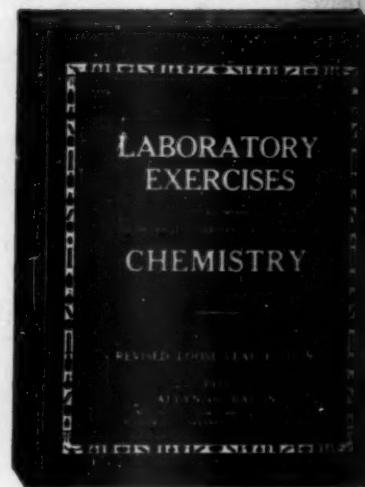
The pathways to the sciences were not dull and humdrum, for along the road lay adventure, romance, and even tragedy. Ever the scientist sought the truth. Always he regarded his labors as vain unless he gave a better understanding of the world about him and turned his discoveries to the service of mankind.

Chemistry offers a rich field to the inquiring mind and brings great reward to those who understand its teachings. It is of constant practical value. It tells how to select proper materials for every kind of construction. It has rendered available many metals and special alloys that make our trains, automobiles, and airplanes more serviceable. It has made the soil more fertile and has revealed the nature of our food. It shows us that the human body is a living chemical laboratory, and that even thought has a chemical basis.

The modern textbook in chemistry reflects its history, spirit and service to mankind. It is not a mere epitome of facts—scientific principles serve as luminous guides along the course the learner must take. Vivid illustrations and simple language make clear the practical applications of science. There is careful selection of valuable topics properly grouped. There are devices for testing the learning of the student in accord with modern educational practice.

Tested laboratory exercises supplement the ideal textbook and guide the student in his first-hand study of chemical phenomena. They make him appreciate the vividness of chemical reactions and train him to draw only those conclusions justified by the observed facts.

Best of all, the study of chemistry in this modern manner trains the mind in straight, honest thinking—the true preparation for facing the realities of the present day.



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